DOCUMENT RESUME

ED 441 600 PS 028 609

AUTHOR Love, Arlene; Sikorski, Pat
TITLE Integrating Technology in a Montessori Classroom.
PUB DATE 2000-05-00
NOTE 14p.
PUB TYPE Guides - Non-Classroom (055)
EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Computer Software Selection; *Computer Uses in Education; *Educational Technology; Elementary Education; *Elementary School Teachers; Internet; *Montessori Method; *Teacher Attitudes
IDENTIFIERS Montessori Schools

ABSTRACT

The importance of the prepared environment to the Montessori educational philosophy necessitates careful teacher training to successfully implement computer technology in the Montessori classroom. This paper explores the views and experiences of 11 Montessori teachers in integrating computers in their classroom. The paper maintains that Maria Montessori would likely embrace computer technology in the classroom and that the current question should be when, where, and how children should be introduced to computer experiences rather than whether they should be exposed to computers. The concerns of Montessorians with regard to educational technology are presented, including insecurity when encountering the unknown and concerns about diluting the purity of the Montessori philosophy and method. The paper also lists characteristics of computer software that should be considered in software selection. Benefits of appropriate computer software are described. Also detailed are the impressions of 11 Montessori public school educators who evaluated the use of iMac software specifically and educational technology generally. The teachers suggested that computer software may complement the Montessori curriculum and allow the child to move to a more abstract level after mastering the Montessori manipulatives. Teachers generally used the iMac software to support the program through research or extensions of lessons. Almost all the teachers agreed that technology reflects the Montessori philosophy because children need to adapt and be knowledgeable about technology. The paper concludes with a discussion of the use of the Internet. (KB)

Reproductions supplied by EDRS are the best that can be made
from the original document.

ED 441 600

Integrating Technology in a Montessori Classroom.

Arlene Love
Pat Sikorski

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
☐ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL HAS BEEN GRANTED BY
Arlene Love
Pat Sikorski
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

1

PS 028609

BEST COPY AVAILABLE

Integrating Technology in a Montessori Classroom

By Arlene Love & Pat Sikorski

Abstract

Do computers belong in a Montessori Classroom? Montessori teachers see a definite need to integrate computer technology in their classroom. They see it as playing an obvious large role in our society that needs to be addressed in the classroom appropriately. Since the prepared environment is so essential to the Montessori philosophy, teacher concerns reflected more training is necessary in order to successfully implement computer technology in the Montessori classroom. This article will explore the views and experiences of computer technology by several Montessori teachers.

Introduction

Maria Montessori was the first woman doctor to graduate from an Italian university in the late 1800's. She became very interested in educating young children, and had an opportunity to work with children thought to be uneducable by society. It was her scientific training along with her observational skills that allowed her to develop manipulative learning tools where these children became as "intelligent" as their so-called "normal" peers. The learning materials and philosophy caught on, and the Montessori method of teaching continues to thrive today. Yet, technology adds a new and challenging perspective to the Montessori approach to learning.

Montessori and Technology

How would Maria Montessori respond to technology in the classroom if she were alive today?

Being a visionary whose innovative ideas were so unconventional for her time, Maria Montessori would, no doubt, embrace computer technology in the classroom. It would be

PS 028609

again, through her prior training and skills that she would carefully extensively "follow the child", and encourage other educators likewise, keeping in mind that the goal in early childhood education is to cultivate the child's own natural desire to learn. It is through these practices, that one would hope, the educator stands to learn and change her/his view and change her/his view towards computer technology, and see it as the children see it, as a normal part of their environment. It is through this interaction, that the child can ironically empower the teacher. Since we, as educators, have the responsibility to prepare our children for a world they will one day inherit, computer technology is indeed a necessary experience that needs to be modeled in the classroom.

Technology in the Classroom

N. Postman, author of "Technopoly: The Surrender of Culture to Technology", explains that "Technological change is neither additive nor subtractive. It is ecological. I mean "ecological" in the same sense as the word how it is used by environmental scientists. One significant change generates total change. If you remove caterpillars from a given habitat, you are not left with the same environment minus caterpillars: you have a new environment, and you have reconstituted the conditions of survival; the same is true if you add caterpillars to an environment that has had none. This is how the ecology of media works well. A new technology does not add or subtract something. It changes everything (Postman, 1993, p.18)."

Peter Montminy, chair of the Education committee at Our Children's Center, a Montessori school in Central, PA acknowledges that "Computers are gaining an ever-expanding role in our culture and our daily lives. The information age is upon us;

computers are critical tools of success in nearly every aspect of society—from communications and transportation, to business and industry, to science and education. It no longer makes sense to ask *if* our children should be exposed to computers, but rather *when, where* and *how* should we introduce our children to *what kind* of computer experience" (Montminy, p.30).

In his article "Best Practice Guidelines for Computer Technology in the Montessori Early Childhood Classroom", Montminy discusses concerns shared by fellow Montessorians. He reports that "Many Montessorians are apprehensive about technology in the classroom. Some of the anxiety is based on the same insecurity that we all feel when confronted with change of the unknown. There is also some concern that the purity of the philosophy/method will be compromised by the introduction of technology into traditional Montessori environment. Because I've experienced and voiced these anxieties myself, I can appreciate them. However, when a new job forced me to use technology every day, I began to reconsider" (Grimes, Doughty, p. 33). In researching various practices in regards to incorporating appropriate use of technology in the classroom, a wealth of helpful information was found. Some questions researched include, how do you choose developmentally appropriate software? Listed below are some goals and educational characteristics that computer software should include:

* "The materials should exhibit a discernible *sequence* or order so that it makes sense to the child and can extend the child's thinking in a logical progression. The material must provide an *optimal level of stimulation that engages* the child, maintains interest and concentration, yet does not overwhelm or merely entertain.

* The materials should be *esthetically pleasing* and beautiful to the senses, as well as wholesome, peaceful, and nonviolent.

* The content of the computer program must be *meaningful and useful* to the child, that is *age-appropriate*. The way of interacting with the program should also be age-appropriate in terms of promoting, and not frustrating, fine or gross motor movement.

* It should be more *process-focused* (promoting exploration and learning), rather than product-focused (emphasizing achievement or the failure to achieve a specific outcome).

* It must contain *good 'control of error.'* That is, the materials must have built-in flexibility that allows the child to be self-directing, self-pacing, and self-correcting. Related to this is the ability of the material to promote independent exploration by the child, after initial instruction and orientation with the teacher.

* The materials should have *multiple levels of difficulty* built into it.

* It should *promote the child's creativity*, rather than providing exhaustive information and stimuli that leaves little room for the child's own imagination and ideas.

* It should *emphasize internal motivation*, rather than promoting a heavy dependence on external reinforcement (e.g. overplaying positive and negative feedback with bells, whistles, points, and grand prizes).

* And the materials should *enhance or compliment the teaching* that is going on elsewhere in the classroom. It should be well integrated within the learning environment, rather than competing with other instructional processes and materials in the classroom.

The committee acknowledges that computer technology is a "valuable skill in our modern world", that is it can be a stimulating tool both visually and auditory, and provides excellent "tool for repetition and reiteration" which can compliment teacher-presented material by teaching it in a different way (Moniminy, 1999, p.31)."

Benefits of Appropriate Software

"The student's needs are met through sensible educational software … this affords the opportunity for trial and error in a non-judgmental environment without fear of failure. The computer also puts the student in charge of the learning giving feedback as well as individualized instruction. This individualized instruction allows for remedial help, as well as, the advanced learner can move ahead.

"Computer use in the classroom is open-ended; process not product is the ultimate goal. Not only are cognitive skills developed, but physical skills as well … eye/hand coordination and small muscle development. Research tells us that children in classrooms with computer exposure have significantly greater gains in self-esteem. Children exposed to open-ended software had significant gains on measures of intelligence, nonverbal skills, structural knowledge, long-term memory, and complex manual dexterity. When the computer was supplemented with hands-on activities that reinforced the major objectives of the software, children gained in all areas of these areas, as well as in verbal skills, problem solving, abstraction, and conceptual skills. Children exposed to open-ended programs displayed more wondering and hypothesizing, formulated and solved their own problems, collaborated with a partner, evaluated their own work more positively, were more motivated in learning settings, and had a more positive attitude toward learning. Research suggests that children are not discriminating in the computer

programs that they will play with and enjoy; it is up to teachers to select software that fosters children's development and is integrated with the curriculum as a whole" (Clements & Nastasi, 1992, p. 66).

"Several evaluation systems are available to help educators select software. It is important to select an evaluation system that is congruent with the philosophical approach of the program in which the software will be used. The Developmental Software Evaluation Scale, developed by Susan W. Haugland and Daniel D. Shade, is designed to reflect a Piagetian developmental approach to learning. Young children learn best by doing, interacting, and exploring, rather than by watching and/or listening. Children are intrinsically motivated to discover, to experiment, and to learn. They are ready for and capable of learning a wide variety of skills, abilities, and concepts. The key is presenting the concepts and skills at a level that the child is ready to learn, using a method that reflects the child's interests and needs. The criteria for software evaluation are congruent with NAEYC guidelines for developmentally appropriate practices" (Haugland & Shade, 1990, p.70).

iMac Software

Eleven Montessori Public School educators provided their input regarding the compatability of technology and the Montessori curriculum. Two shared their findings using the iMac software their district employs. Nine others voluntarily answered a questionnaire regarding technology use in their classrooms. The following reasons support their opinions.

- Each compact disc is developmentally appropriate for several levels, rather than one grade level, allowing the child to progress to the next level after mastery.
- The software proves to be complimentary extensions to the Montessori curriculum, where the child moves to abstract after mastering the Montessori manipulatives.
- The computer programs follow the Montessori philosophy's 3-period lesson by introducing nomenclature to the child (the first period), followed by giving commands and providing a control of error for the child to see and correct (the second period), and reinforcement through application (the third period).
- The programs use the child's name while moving her/him through progressive activities, and allow the child to see his progression in a tracking section on the software. For example, a child clicks on his name with the mouse and a bookshelf is displayed. Initially it is empty, but as the child masters a program, a book labeled A is placed on the shelf. Each time a program is mastered, a book is placed beside the previous one. The books are labeled from A-Z, giving a sense of order to the program (another crucial Montessori requirement). This is a personalized, visual way for the child and teacher to track learning, and, because it is individualized, the appropriate screen automatically appears each time the child signs in. This, encourages independence, while allowing the teacher to continue working with other children.

- The software is child friendly because it provides an assortment of voice choices that are appealing to children (i.e. a whisper, a child's voice, etc.). The rate and tone of the voices are adjustable for finer articulation. There are accents for cultural awareness, and kids faces with different skin colors.
- The programs model proper language and punctuation.

An example of appropriate language software includes **Bailey's Bookhouse**. This program introduces the child to initial sounds, color words, adjectives, etc. using pictures and letters. Sight and text words, as well as visuals are reinforced before an activity, to ensure success by the student. Again, this is a correlation with the Montessori philosophy.

Furthermore, **Claris Works** has an activity that is an excellent extension to the Montessori Geography puzzles. In this program, you choose a continent map and place, by dragging with the mouse, countries or states to a control map. Once mastered, there is a section below the map for written work to be typed.

Talking Number Maze provides children with story problems to solve among other programs. You can choose to have the story read to the child or have the child read it silently. Next to the story problem is an equation that is set up with a square for each digit, as well as an oval for the mathematic operation you choose to use. These serve as a control of error because if you are adding a 2-digit number to a 1-digit number, the equation controls this by the number of squares in each row. A key is on the bottom in order for the child to click on the number and mathematical operation he decides to use to solve the story problem. If the child makes a mistake, a blue line illustrates this by blinking in the place where the error occurred. For

example, if the child subtracts instead of adds, a blinking blue line under the symbol in the equation lets the child know where he made his mistake. In other words, there is a built in control of error.

Some important facts to keep in mind with regard to computer instruction are:

- To first make sure the child is ready for abstract operations by making sure he/she has mastered manipulatives.
- Not all children progress at the same rate.
- Carefully monitor the child's use of the programs. This may alert the teacher that the child is experiencing difficulty in a certain area and may have to take a step back. This will also tell whether the child is guessing. Luckily, some of the iMac programs monitor the user, telling them if a program is too difficult and to either try again or will bring them back to the previous exercise. What more can a teacher ask for!

The following are responses to a questionnaire that nine Montessori Public School teachers voluntarily filled out.

When asked if they integrate technology in their Montessori classroom, all teachers responded "yes", one teacher uses it only for 3rd graders research.

All teachers use the iMac software to support the Montessori program by means of research, and/or complimentary extensions to their lessons. One teacher uses it as a resource for creating manipulatives.

In regards to how much time during the day children used the computer, each teacher's response varied, ranging from 15-40 minutes, to unlimited sessions. Also, extra time was allowed for research.

Almost all teachers agreed that technology reflects the Montessori philosophy because children need to adapt and be knowledgeable about technology. One educator felt the computer was "overkill" because she felt "the Montessori Curriculum is so rich with information and manipulatives." Also, she felt children like kinesthetic objects to use and feel.

These educators expressed the following concerns:

- Children will exit a program when it becomes too difficult rather than be challenged to the next level.
- It is seen as an escape for children who lack social skills, or have language barriers.
- Children use the computer as entertainment, a toy, or wasteful activity.
- Insufficient teacher training in order to create the ideal learning experience.
- Careful monitoring and strict control is necessary for Internet use.
- The computer is seen as a distraction.

Internet

The information highway, the Internet, World-Wide Web is available to help our children keep up with the ever-increasing flow of information that defines our world today and just may determine the world of tomorrow. We can now reach out to each other from world events and from the interests that people share throughout various cultures. Use of computer online at home with a parent stimulates good family interaction, helps keep the child centered on materials of high value. Information is the

future and future is available to us now. A comprehensive set of books in the classroom is helpful but with the Internet, you say "go search". The information is right at you finger tips less the expense of a library of books and the bother of getting the books and bringing them into your classroom.

Internet is a mind exercise … the mind exercise can be a journey that starts looking for information with one direction and winds up either deeply ingrained in further and further refinements of the original concept or tangentially moved into new realms that never occurred until curiosity finds a link. Children not only interact with peers as they work at the computer; through computer networks they communicate with children in other communities and countries" (Gates, 1995, p.17).

Conclusion

Computer technology has the potential to enrich the learning experience in the Montessori Classroom. In order to accomplish this successfully, the teacher needs to be empowered through training, so that he/she is as comfortable with its possibilities as today's child.

REFERENCES

Clements and Nastasi. (1992). Young Children: Active Learners in a Technological Age. Washington DC: National Association for the Education of Young Children.

Doughty, S. G. (Winter, 1996). Integrating Montessori Curriculum and Technology: A Computer Approach to Social Studies' "Fundamental Needs", Montessori Life, Vol. 8/No. 1, p. 33.

Gates, (all 1995). Traveling the Information Highway. Tomorrow's Child, Vol. 3/No. 5, p. 17.

Haugland & Shade, (1990), p. 70. Young Children: Active Learners in a Technological Age. Washington DC: National Association for the Education of Young Children.

Montminy, (Fall, 1999) Best Practice Guidelines for Computer Technology in the Montessori Early Childhood Classroom. Montessori Life, Vol. 11/No. 4, p. 30.